

CLAIMS

1. A method for treating ventricular dysfunction, heart failure, or imbalance of
5 autonomic tone or endocrinological system, comprising:

providing at least one electrode in a region associated with nervous tissue in a patient's
body; and

applying electrical stimulation via the at least one electrode to improve the cardiac
efficiency of the patient's heart.

2. The method of claim 1, wherein providing at least one electrode further comprises
providing at least one implanted electrode located adjacent to a patient's spine.

3. The method of claim 1, wherein providing at least one electrode further comprises
15 providing at least one electrode located external to the patient's body.

4. The method of claim 1, wherein providing at least one electrode further comprises
providing at least one electrode located in a subcutaneous space of the patient's body.

5. The method of claim 1, wherein applying electrical stimulation further comprises:
20 monitoring one or more predetermined physiologic parameters of the patient; and adjusting the
electrical stimulation based on the one or more predetermined
physiologic parameters.

6. The method of claim 5, further comprising administering cardiac
25 resynchronization therapy; and wherein adjusting the electrical stimulation further comprises
adjusting the electrical stimulation based on the administered cardiac resynchronization therapy.

7. The method of claim 1, wherein providing at least one electrode further comprises
30 providing at least one electrode in a region containing a nerve associated with a trunk portion of
the body of the patient.

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8. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic vertebrae.

9. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic vertebrae in the range of T1-T12.

10. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing thoracic vertebrae T1-T12.

11. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic nerve bundle.

12. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic nerve bundle in the range of T1-T12.

13. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing thoracic nerve bundles T1-T12.

14. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode located adjacent to an intrinsic cardiac ganglia.

15. The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode located within a cardiac or vascular structure for intracardiac or intravascular neurostimulation.

16. The method of claim 1, wherein the at least one electrode is selected from the group consisting of implanted electrodes, cutaneous electrodes, and subcutaneous electrodes.

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17. An apparatus for treating ventricular dysfunction, heart failure, or imbalance of autonomic tone or endocrinological system, comprising:

at least one electrode located in a region associated with nervous tissue in a patient's body; and

5 means for applying electrical stimulation via the at least one electrode to improve the cardiac efficiency of the patient's heart.

18. The apparatus of claim 17, wherein the at least one electrode further comprises at least one implanted electrode located adjacent a patient's spine.

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19. The apparatus of claim 17, wherein the at least one electrode is located external to the patient's body.

20. The apparatus of claim 17, wherein the at least one electrode is located in a subcutaneous space of the patient's body.

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21. The apparatus of claim 17, wherein means for applying electrical stimulation further comprises:

means for monitoring one or more predetermined physiologic parameters of the patient;

20 and

means for adjusting the electrical stimulation based on the one or more predetermined physiologic parameters.

22. The apparatus of claim 21, further comprising means for administering cardiac resynchronization therapy; and wherein the means for adjusting the electrical stimulation further comprises means for adjusting the electrical stimulation based on the administered cardiac resynchronization therapy.

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23. The apparatus of claim 17, wherein the at least one electrode is located in a region containing a nerve associated with a trunk portion of the body of the patient.

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24. The apparatus of claim 17, wherein the at least one electrode is located in a region containing at least one thoracic vertebrae.

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25. The apparatus of claim 17, wherein the at least one electrode is located in a region containing at least one thoracic vertebrae in the range of T1-T12.

26. The apparatus of claim 17, wherein the at least one electrode is located in a region
5 containing at least one thoracic nerve bundle.

27. The apparatus of claim 17, wherein the at least one electrode is located in a region containing at least one thoracic nerve bundle in the range of T1-T12.

10 28. A method for treating ventricular dysfunction, heart failure, or imbalance of autonomic tone or endocrinological system, comprising:
providing at least one electrode in a region associated with nervous tissue in a patient's body;
applying electrical stimulation via the at least one electrode to improve the cardiac
15 efficiency of the patient's heart;
monitoring one or more predetermined physiologic parameters of the patient; and
adjusting the electrical stimulation based on the one or more predetermined
physiologic parameters.

20 29. A method, comprising:
providing at least one electrode in a region associated with nervous tissue in a patient's body;
applying electrical stimulation via the at least one electrode to alter the functioning of a patient's heart;
25 monitoring one or more predetermined physiologic parameters of the patient; and
adjusting the electrical stimulation based on the one or more predetermined
physiologic parameters.

30 30. An apparatus for treating ventricular dysfunction, heart failure, or imbalance of autonomic tone or endocrinological system, comprising:
at least one electrode located in a region associated with nervous tissue in a patient's body;

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means for applying electrical stimulation via the at least one electrode to improve the cardiac efficiency of the patient's heart;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient; and

5 means for adjusting the electrical stimulation based on the one or more predetermined physiologic parameters.

31. An apparatus, comprising:

10 at least one electrode located in a region associated with nervous tissue in a patient's body;

means for applying electrical stimulation via the at least one electrode to alter the functioning of the patient's heart;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient; and

15 means for adjusting the electrical stimulation based on the one or more predetermined physiologic parameters.

32. An apparatus, comprising:

20 at least one electrode located in a region associated with nervous tissue in a patient's body;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient; and

25 a controller adapted to apply electrical stimulation via the at least one electrode to alter the functioning of the patient's heart, and the controller being further adapted to adjust the electrical stimulation based on the one or more predetermined physiologic parameters.

33. An apparatus for treating ventricular dysfunction or heart failure, comprising:

at least one electrode located in a region associated with nervous tissue in a patient's body; and

30 a controller adapted to apply electrical stimulation via the at least one electrode to improve the cardiac efficiency of the patient's heart.

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34. The apparatus of claim 33, wherein the at least one electrode is adapted for positioning in a region containing thoracic nerve bundles T1-T12.

5 35. The apparatus of claim 33, wherein the at least one electrode is adapted for positioning adjacent to an intrinsic cardiac ganglia.

10 36. The apparatus of claim 33, wherein the at least one electrode is adapted for positioning within a cardiac or vascular structure for intracardiac or intravascular neurostimulation.

37. The apparatus of claim 33, wherein the controller includes a driver circuit to deliver electrical stimulation to a cardiovascular system in the patient's body.

15 38. The apparatus of claim 37, wherein the driver circuit includes a circuit to deliver pacing pulses.

39. The apparatus of claim 37, wherein the driver circuit includes a circuit to deliver high-voltage stimulation.

20 40. The apparatus of claim 33, wherein the controller includes a drug-delivery device to provide a biologically-active agent to the patient.

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